

Drumheller River Hazard Study

The purpose of the Drumheller River Hazard Study is to assess and identify river and flood hazards along 53 km of the Red Deer River, 8 km of Kneehills Creek, 5 km of Michichi Creek, 10 km of the Rosebud River, and 3 km of Willow Creek, through the Town of Drumheller and adjacent municipalities.

The new river hazard study will be completed under the provincial Flood Hazard Identification Program (FHIP), the goals of which include enhancement of public safety and reduction of future flood damages through the identification of river and flood hazards. The provincial study is being co-funded through the federal National Disaster Mitigation Program.

The study is complex, and the scope and scale of work is larger than previous provincial flood hazard studies. Hydraulic modelling, flood inundation mapping, and flood hazard mapping along the Red Deer River, Kneehills Creek, Michichi Creek, the Rosebud River, and Willow Creek are primary deliverables. The study also includes hydrology assessment, survey and base data collection, flood risk assessment and inventory, and channel stability investigation components.

The Drumheller River Hazard Study will begin in June 2018 and is expected to be complete by spring 2020. River survey work is expected to begin in early July and be complete by winter 2018.

We recognize there will be tremendous interest in any new flood mapping. Our study finalization process includes municipal review and public engagement for major components, as appropriate. Our goal is to provide useful tools to communities and the public as soon as possible.

More information about the Alberta Flood Hazard Identification Program can be found at:

- www.floodhazard.alberta.ca

If you have any questions regarding this work, the project engagement specialist, Julia Frohlich, can be contacted at:

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Project Background

The Drumheller River Hazard Study project will assess and identify river and flood hazards along 53 km of the Red Deer River, 8 km of Kneehills Creek, 5 km of Michichi Creek, 10 km of the Rosebud River, and 3 km of Willow Creek, through the Town of Drumheller, Kneehill County, Starland County, Wheatland County, and Special Areas No. 2.

The main study deliverables outlined below include a hydrology assessment, new hydraulic river models, updated and new flood inundation and flood hazard mapping, a flood risk inventory, and a channel stability assessment – all of which will be provided to each community within the study area to support their local emergency response and land-use planning needs.

- **Survey & Base Data Collection**

Hydraulic models and flood maps require high-accuracy base data. Field surveys and LiDAR remote sensing are used to collect river and floodplain elevations, channel cross section data, bridge and culvert information, and dedicated flood control structure details.

- **Hydrology Assessment**

The hydrology assessment estimates flows for a wide range of possible floods along the Red Deer River, Kneehills Creek, Michichi Creek, the Rosebud River, and Willow Creek, including the 2, 5, 10, 20, 35, 50, 75, 100, 200, 350, 500, 750 and 1000-year floods.

- **Hydraulic River Modelling**

A new hydraulic computer model of the entire river system will be created using new survey data and modern tools. The model will be calibrated using surveyed highwater marks from past floods to ensure that results for different floods are reasonable.

- **Flood Inundation Mapping**

Flood maps for thirteen different sized floods, based on the hydraulic model results and the hydrology assessment, will be produced. Flood inundation maps can be used for emergency response planning and to inform local infrastructure design. These maps identify areas of potential isolated flooding and areas that could be flooded if local berms fail.

- **Flood Hazard Mapping**

Flood hazard mapping divides the 100-year floodplain into floodway and flood fringe zones, which show where flooding is deepest and most destructive. The flood hazard mapping will reflect the worst-case flood hazard of the open water and ice jam scenarios, if ice jam flooding is a significant concern. These maps can be used to help guide long-term development planning.

- **Flood Risk Assessment & Inventory**

An inventory of structures at risk of flooding for all of the mapped flood scenarios will be created. This flood risk assessment and inventory can support future flood damage assessments.

- **Channel Stability Investigation**

The main goal of this study component is to provide insight into general channel stability along the Red Deer River, Kneehills Creek, Michichi Creek, the Rosebud River, and Willow Creek. We will compare current and historic riverbank locations and channel cross sections as far back as 1949 using historic aerial photos.